Space Weather Forecast

Issued on Tuesday, 28 February 2023 at 13:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: G1/Minor Storms possible 28 Feb, with the recent coronal mass ejection arrival influence easing. Chance of Moderate flares, with slight chance of Strong flares.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Low with only low energy Common-class flares observed. There are seven sunspots on the visible disc, with the most significant of these, a large and magnetically complex region in the northwest quadrant. A further region on the northeast limb may appear more complex as it rotates further into view. No Earth-directed CMEs have been observed on visible imagery.

Solar Wind / Geomagnetic Activity: Solar winds have declined from strong or very strong to close to elevated levels through the period as the effects of two recent CMEs ease. A fast solar wind, which was masked by the CME effects has now become evident. Total magnetic field strength eased from strong to moderate values, with the north-south component, Bz starting moderately negative, but becoming weakly positive or near neutral later in the period. Geomagnetic activity started at G2/Moderate Storm levels falling to G1/Minor Storm for one interval, but has been Quiet since.

UK Aurora Analysis: Aurora was sighted across much of central and northern UK and some parts of southern England due to the geomagnetic storms.

Energetic Particles / Solar Radiation: The count rate of energetic particles has been has fallen towards background levels through the last 24 hours.

Four-Day Space Weather Forecast Summary
Solar Activity: Low to Moderate activity is forecast through the period, mainly due to the large, complex region AR3234 in the northwest quadrant. An emerging region in the far northeast may also start to contribute to the flare risk.

Solar Wind / Geomagnetic Activity: Recent CME activity is declining, with speeds decreasing towards elevated levels. No further CMEs are forecast to affect the Earth. Solar winds are expected to slowly decline towards slightly elevated or background levels by the end of 01 Mar as the high speed stream effects decline. Geomagnetic activity is forecast to start mainly Quiet to Unsettled, but with an initial small chance of Active to G1/Minor Storm intervals. Mainly Quiet for the remainder of the period.

UK Aurora Forecast: As the geomagnetic storms have eased, aurora is only expected to be visible for the far north of the UK overnight on 28 Feb.

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Energetic Particles / Solar Radiation: The count rate of energetic protons is expected to fall to background with only a slight chance of further enhancements. These are most likely to be due to any flares from the large sunspot in the northwest.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	30	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	50	50
Very Active	R3 to R5 X	No	20	20	15	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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